

## **Nutrition and lifestyle**

### **- Are women in their 20s and 30s putting themselves at risk? -**

#### **Introduction**

Over the last few years there has been a steady stream of advice and information put out by the UK government in a bid to halt what is seen as a decline in the nation's health and a slide into obesity. But are we getting the message?

Adults are recommended to do 30 minutes of moderate activity on at least five days a week, women have been told to keep their alcohol intake to no more than 14 to 21 units a week and few can fail to be aware of the advice to eat 'five-a-day'; that is, five portions of fruit and vegetables. In the case of smoking the government has gone even further, making it harder to smoke freely by banning smoking in public places.

Yet with an increasingly sedentary lifestyle, changing attitudes to drinking alcohol and the availability of quick and easy alternatives to home-cooked meals, it's easy not to act as healthily as we should.

In particular, fears have been raised about young people who may have grown up knowing little different from the current attitudes and habits concerning various lifestyle choices. The long-hours work culture also has a part to play, influencing the choices people make when considering their diet and exercise routines, and contributing to a general feeling of tiredness.

These concerns formed the basis for a new research study commissioned by the Health Supplements Information Service (HSIS), the results of which are included in this report. HSIS wanted to find out exactly how young women in their

20s and 30s are living their lives and how they feel. Do they eat properly, do they exercise enough and is their lifestyle making them feel tired?

Some of the results HSIS uncovered are shocking, showing a generation of young women who are clearly risking their health and a significant number who are tired, stressed and too busy to look after themselves.

This report published by HSIS is a wake-up call to all young women. If you aren't looking after yourself, you are not alone but you should be doing something about it now.

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## Section 1: Overview

### Chapter 1 – Exercise

Our lifestyle choices include what we put into our bodies and how we use them. We all know that exercise is good for us, but do we actually take note of what we are told?

**FACT...**

**Fewer than one in five women in their 20s and 30s exercises as often as the government recommends, which is at least 30 minutes of moderate intensity activity daily on five days a week or more<sup>2</sup>.**

The HSIS survey group of young women in their 20s and 30s were asked how often they exercised (in terms of physical activity that is done for its own sake)<sup>1</sup>. Over half (55.1%) manage to exercise three times a week or more, but more than a quarter (26.4%) exercise once a month or less, with 16.3% of young women admitting that they never exercise.

With so much publicity surrounding the government's exhortations to exercise regularly<sup>2</sup> why do people make the decision not to exercise? Although around a third of young women (32.5%) say they do make time to exercise regularly, others don't because they say they don't have time (16.3%) or don't like it or see no point (10%). Nearly one in five (18.8%) claim that they are active enough in their daily life not to need additional exercise.

So what gives us the motivation to exercise? Just over a quarter (26.3%) say they want to keep healthy and/or supple and nearly one in five (17.5%) say that they actually enjoy being active and that exercise gives them energy. Weight and

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<sup>1</sup> Examples given included going to the gym, playing sport, workouts at home, dancing, running or walking for pleasure.

<sup>2</sup> "At least five a week: Evidence on the impact of physical activity and its relationship to health; A report from the Chief Medical Officer"; 29<sup>th</sup> April 2004; Department of Health website ([www.dh.gov.uk](http://www.dh.gov.uk))

shape are also strong motivational factors, with just over a quarter (26.3%) citing a need to lose weight and one in eight (12.5%) mentioning that they want to stay slim.

The motivating factors appear to affect how often young women exercise: nearly one in four (38%) of those who want to lose weight exercise every day, while those who exercise to stay healthy are less likely to exercise daily, doing so instead once to three times a week.

Joining a gym is a very visible sign of a desire to get fit, but of the HSIS study respondents fewer than one in five (18.8%) has gym membership and even fewer (13.8%) go regularly.

## Chapter 2 – Diet

Along with exercise, diet plays a key factor in determining our health. Again, some government messages have been hard to miss, so are we eating what we should?

### **FACT...**

**38.5% of the study's respondents turn to a takeaway meal because they are too tired to cook or because it is more convenient.**

Over two-thirds<sup>3</sup> of young women (67.5%) admit that they sometimes skip meals because they are too busy to eat and most of them (88.8%) eat 'junk food', although two-thirds of them feel guilty afterwards.

**Nearly half (47.5%) say that they had a healthier diet when they were children** and the same number agree that they find it difficult to eat five servings a day of fruit and vegetables.

### **So what are we eating?**

If only a half of young women admit that they find it hard to eat five portions of fruit and vegetables a day, are the other half eating as well as they think? This report looks at how frequently young women eat a variety of foods including wholegrains, dairy foods, fruits and vegetables and foods containing Omega 3.

It's been widely publicised that a healthy diet includes at least five servings a day of fruit and vegetables: these can include fresh and processed foods, salad and fruit juice, but not potatoes. Yet although half of women in their 20s and 30s say they don't find it hard to do this, **the average number of servings of fruit and veg consumed by them is just three a day**, with over half (52.5%) eating less than this and only a third (32.5%) managing to eat three to four portions.

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<sup>3</sup> The HSIS survey respondents mainly had a mixed diet including meat (73.8%), with 16.3% on a low calorie/slimming diet and a small number being vegetarian or on a low fat or no-dairy diet.

The ideal diet also includes at least three portions of wholegrains a day. Sources of wholegrains include wholemeal bread, breakfast cereals, beans, nuts and seeds. The bad news is that the average (mean) consumption among young women is less than two portions a day, with well over a half (59%) eating less than two.

There are other food groups that are vital for our health too but can get forgotten in the haze of publicity surrounding the “five-a-day” message. Three portions of dairy foods a day is an ideal way to get the calcium and other nutrients we need for bone and general health. However, the female respondents surveyed highlighted that on average they just get two portions of dairy foods a day, with two-thirds (67.5%) having less than this.

The final dietary component looked at in this HSIS report was Omega 3. These fatty acids are an important part of a healthy diet: the UK government recommends that young women eat one or two portions of oily fish a week to achieve an adequate supply. But young women are eating on average just over one portion of oily fish a week, with over half (57.5%) eating less than one portion.

The shocking dietary truth of women in their 20s and 30s:  
Only 4% eat the recommended amount of wholegrains  
Only 15% manage to eat the recommended amount of fruit and vegetables  
Only 10% eat the ideal amount of dairy foods  
Less than a quarter (22.5%) eat enough oily fish to provide them with adequate Omega 3.

## The alternatives

One of the main culprits blamed for our poor diets is the humble takeaway. Almost two-thirds (65%) of young women say that they eat takeaways as a main meal occasionally, with a further quarter (23.8%) eating them at weekends. As a result, over half eat takeaways because they or their partner like them and well over a third (38.3%) eat them because they are too tired or because they are more convenient than cooking.

Eating away from home, where you cannot prepare meals in your own kitchen, is also sometimes used as a reason for not eating well. However, only a quarter of our survey respondents (25%) agreed that they ate less healthily at work, with their reasons being fairly evenly divided between snacking when bored, giving in to temptation when offered unhealthy foods and being easier to choose an unhealthy option.

The way food is presented to us doesn't always help our good intentions: well over a third (40%) of young women admit that they take advantage of deals that offer free crisps or chocolate with a sandwich, even if they don't want it.

## Diets...

When food and young women are discussed together, the subject invariably turns to dieting. Among women in their 20s and 30s, over a third (36.3%)

admitted they were either always on a diet or had dieted several times. Only just over a third of them claimed they had never been on a diet to lose weight. The reasons for dieting varied, but the overwhelming one was because they felt fat (60.8%), with a third (33.3%) dieting for a special event or holiday.

**FACT...  
10% of young  
women say that they  
are always on a  
weight loss diet**

So how do we feel about dieting and why do we do it? The media has a large part to play: just over half of young women agree that seeing images of thin

celebrities in the media makes them feel fat and these women are significantly more likely to have been on a weight loss diet.

**...And more**

And how extreme are we prepared to be in our quest for losing weight and getting a better body? 50% of those surveyed said they would go on a crash diet if they needed to lose a few pounds quickly and one-third (35%) would consider cosmetic surgery to improve their body shape or size.

### Chapter 3 – Dietary supplements

Given that the dietary intake of women in their 20s and 30s is so far from ideal, are they doing anything to make up for it?

Well, some of them are. Just under a quarter (22.6%) take multi-vitamin or other dietary supplements, although not everyone takes them every day. Half of these are taking multivitamins, with just over a quarter (27.8%) taking fish oils and the same number taking Evening Primrose, borage or starflower oil.

Of those that do take a supplement, the majority (61.1%) take them to make sure that their nutrient intake is adequate, while the other primary reason (16.7%) stated is for a specific ailment.

#### **Do they make a difference?**

Of those who do take dietary supplements, 50% of the study's respondents highlighted improvements in bone/joint health, boosting the immune system to helping users being less tired or having more energy.

Among those who aren't currently taking supplements, just over a quarter had taken them in the past, with the main reason for stopping being lack of effort.

**FACT...**  
**Even though the majority of women in their 20s and 30s are not getting enough wholegrains, dairy foods, Omega-3 and fruit and vegetables, over three-quarters (77.5%) don't make up for it by taking a dietary supplement**

## Chapter 4 – Smoking and alcohol consumption

No matter how well you eat or how much you exercise, if you smoke you risk damaging your health. Indeed, smoking is known to be the principal avoidable cause of premature deaths in the UK<sup>4</sup>. The consumption of too much alcohol is also known to present risks to health: the Department of Health recommends that women should not drink more than two to three units of alcohol per day (with separate guidelines for those trying to conceive or who are pregnant and for all women in certain circumstances)<sup>5</sup>.

### Smoking

Among the women in their 20s and 30s surveyed for this report, just over a quarter (26.3%) admit that they smoke, and nearly a quarter (23.8%) of these women smoke more than 20 cigarettes a day. Just over a third (38.1%) smoke between 10 and 20 cigarettes daily.

Illustrating the addictive nature of cigarettes, nearly a half (47.6%) of smokers say that 'habit' is the main reason that they smoke: these women are significantly more likely than other smokers to have more than 10 cigarettes a day.

**FACT...**  
**Almost one in five young women cite stress as the main reason for smoking and one in five drink alcohol to help them relax**

### Alcohol

The proportion of young women drinking alcohol is far higher than smoking, at over two-thirds (68.8%), although most (74.6%) say they drink 10 units or fewer a week. Almost half (45.5%) say they drink on two to six days a week, with 16.4% drinking at weekends only.

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<sup>4</sup> Department of Health website, Policy and Guidance section ([www.dh.gov.uk](http://www.dh.gov.uk))

<sup>5</sup> Department of Health website, Policy and Guidance section ([www.dh.gov.uk](http://www.dh.gov.uk))

The main reason that women drink alcohol is to be sociable (47.3%): these women are significantly less likely to drink more than five units a week, whereas those who drink to help them relax (20%) tend to drink six to 15 units a week.

Could they give up drinking alcohol and become teetotal?

Only one in three (38.2%) say they could do so without difficulty, with a further one in two (18.2%) admitting it would be difficult or they would need a very good reason to do so.

Social drinkers were much more likely to say they could find it easy, while those who drink from habit or for relaxation were

more likely to say they would not give up, and those who drink more than 11 units a week were more likely to say that they would have difficulty or simply would not give up.

**FACT...**  
**More than two out of five young women who drink alcohol (43.7%) admit they could not give up drinking and become teetotal**

### **Our bad habits**

Of course smoking and drinking alcohol aren't the only 'bad' health habits among young women. And they aren't our favourite treat: when asked, women in their 20s and 30s agreed that chocolate is actually the one that they would find most difficult to go without (46.3%), with one in five choosing cigarettes (21.3%) from the list which also included alcohol, junk food and coffee. Not surprisingly, smokers were significantly more likely to say they would find it difficult to go without cigarettes: 'drinkers', on the other hand, were more likely to choose chocolate.

Two in five young women (41.3%) do enjoy their 'bad' health habits, although most of these (30%) said they would change them if they had to. Another quarter (26.3%) feel a bit guilty about them. However, a significant quarter of these women say they would really like to change as they feel their habits are not doing them any good.

## Chapter 5 – Stress

With stress cited as a key reason for a significant number of women choosing to smoke cigarettes, how stressed are women in their 20s and 30s? Quite a lot, it seems according to this new study.

**FACT...**  
**More than one in three women in their 20s and 30s (36.3%) sometimes find it difficult to sleep due to worry**

A huge four out of five (80%) agree that they sometimes feel as if they have too much to do and too little time to do it, and 70% are so busy that they find it difficult to find time for themselves. Over 60% admit they sometimes feel depressed.

Work and money cause the most stress, with nearly a half of young women (46.3%) agreeing that they are very or quite stressed about these aspects of their lives. A quarter (25.1%) are very or quite stressed about family matters.

When asked to give specific examples, these women tend to mention work, money or family concerns in equal proportions.

## Chapter 6 - Fatigue

With the majority of women in their 20s and 30s failing to meet targets for eating certain food groups and admitting how busy and stressed they sometimes feel, HSIS decided to look at how tired young women are and how this manifests itself. HSIS also commissioned a comprehensive statistical analysis exercise looking at fatigue and other factors, to see if they were related.

As result, in this study fatigue has been measured by the Chalder Fatigue Score, a thoroughly validated questionnaire, data for which are freely accessible in numerous scientific papers. Low scores (< 4) indicate good vitality and health while higher scores indicate various degrees of fatigue. Combined with data on the duration of the fatigue this scoring system can be used to help define Chronic Fatigue Syndrome.

### Tiredness

Although the majority of women in their 20s and 30s had not been having any more problems than usual with tiredness in the month before the survey, over a third (37.5%) admitted they had been having more or many more problems than usual. In addition, over a third (35.1%) felt they needed to rest more than usual and just under a third (31.2%) had been feeling more or much more sleepy or drowsy in the previous month.

Over the previous month a quarter of the survey respondents felt they had been lacking energy more or much more than usual and around one in five had experienced more or many more than usual problems with:

starting things (20.1%)

having difficulty concentrating (18.8%)

making slips of the tongue when speaking (21.3%)

having problems thinking clearly (21.3%)

**FACT...**  
**Over half of women in their 20s and 30s (53.8%) feel tired for a quarter of the time, with a further quarter of them (26.3%) feeling tired half or more than half of the time.**

Nearly one in five young women (18.8%) said they been feeling tired for more than three months, with another one in five (21.3%) feeling tired for between a week and three months. **A shocking one in 10 of the respondents said they felt tired three-quarters or all of the time.**

### **Fatigue score**

Those who had been having ‘more’ or ‘many more’ problems than usual in the previous month in four or more areas<sup>6</sup> were found to have a higher ‘fatigue score’ (see ‘Section 3 – Results’ for more details). So a ‘higher fatigue score’ means the tiredness shows itself in four or more different ways.

HSIS then went on to investigate the extent to which young women say they are tired is related to the length of time for which they have felt tired. Those who have higher fatigue scores appear to have felt tired for a longer period of time, with those who had been feeling tired for three to six months significantly more likely to have a higher fatigue score.

Those with higher fatigue scores are significantly more likely to feel tired 50% of the time<sup>7</sup>.

By looking only at those women who said they were feeling tired, the report data found a picture of chronic fatigue among a small number of respondents. The majority of respondents who felt tired a quarter of the time (58%) had had these symptoms for less than one week, but among those who felt tired at least half of

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<sup>6</sup> Areas were: problems with tiredness; needing to rest more; feeling sleepy or drowsy; having problems starting things; lacking energy; having less strength in their muscles; feeling weak; difficulty concentrating; making slips of the tongue when speaking; having problems thinking clearly; problems with memory.

<sup>7</sup> The sample size for those who feel tired 75% or more of the time is too small to draw a statistically significant result.

the time there was a tendency for these symptoms to have persisted for over three months.

### **Diet and fatigue**

When the HSIS study looked at how tired young women were and what they ate, there is a statistically significant difference between those with low fatigue scores and those with high fatigue scores.

As a result, those with higher fatigue scores tend to eat less healthily (falling into the 'less healthy' diet group<sup>8</sup>). The vast majority (80%) of those with a healthier diet are less tired, as shown by having low fatigue scores, but only 58% of less healthy dieters have low fatigue scores. That means that **those with a less healthy diet are more likely to suffer fatigue.**

### **Exercise and fatigue**

There is also a statistically significant relationship between how much women in their 20s and 30s exercise and how tired they feel. **Those with lower fatigue scores tend to take frequent exercise:** 77% of frequent exercisers have low fatigue scores compared with 23% of high fatigue scorers. The differences in fatigue scores between those who exercise frequently and those who rarely or never exercise is significant at the 5% level ( $p < 0.05$ )<sup>9</sup>.

It is possible that taking regular exercise leads to a decrease in fatigue (possibly by decreasing stress or improving sleep patterns), but it is also possible that those women who are fatigued feel that they are 'too tired' to exercise. Looking more closely, those with lower fatigue scores are significantly more likely to make

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<sup>8</sup> Cluster analysis was employed to group together respondents who gave similar answers to the food frequency questions. Two clusters were identified: those who tended to eat the specified foods more frequently and therefore could be assumed to have a 'more healthy' diet; and those who ate them less frequently and therefore had a 'less healthy' diet.

<sup>9</sup> See Appendix 1

time to exercise regularly ( $p < 0.01$ ). And young women with higher fatigue scores are significantly more likely to say they ought to exercise but don't have the time ( $p < 0.05$ ).

### **Smoking and fatigue**

There is some indication of a relationship between fatigue and smoking among young women, with those with higher fatigue scores more likely to smoke than those with lower fatigue scores<sup>10</sup>.

### **Stress and fatigue**

Women in their 20s and 30s with higher fatigue scores are significantly more likely to say they are 'very stressed' by their work<sup>11</sup> and those with lower fatigue scores were also less inclined to worry about their health<sup>12</sup>.

Generally 'being busy' would seem to be a reason for these young women to feel tired, with 'worry' playing a significant contributing role. The HSIS respondents in this study who agreed with the statement "I'm so busy that it's difficult to find time for myself" were more likely to have higher fatigue scores ( $p < 0.05$ ) than those who disagreed with the statement. And those who agreed "I sometimes find it difficult to sleep due to worry" also had significantly higher fatigue scores than those who disagreed with the statement ( $p < 0.05$ ).

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<sup>10</sup> This is at the 10% level ( $p < 0.1$ ) so may not be considered statistically significant. A larger sample would be required to determine whether this is a chance result.

<sup>11</sup> The difference between those with low fatigue scores and high fatigue scores who were 'not stressed' or 'very stressed' was significant at the 5% level ( $p < 0.05$ ).

<sup>12</sup> The difference between those with a low fatigue score and those with a high fatigue score who were 'not stressed' about their health was significant at the 1% level ( $p < 0.01$ ) and among those who were 'a little stressed' the difference was significant at the 5% level ( $p < 0.05$ ).

## Section 2

### Conclusion by Dr Walker

Although few people can fail to be aware of the various messages about health that have been given over the last few years, the broad view is that people are not changing their lives for the better. Young people are a particular cause for concern. They may lead very busy lives and have not necessarily grown up knowing anything different in terms of lifestyle and healthy eating.

So are young women in their 20s and 30s risking their health? The answer seems to be a resounding “yes” when measured against widely accepted health advice:

Less than a quarter (23.8%) manage to exercise either every day or every other day.

Only 15% manage to eat five or more portions of fruit and vegetables a day.

Only 4% eat the recommended amount of wholegrain foods.

Only 10% eat enough dairy foods to get the ideal amount of calcium and nutrients needed for bone health and general health.

Less than a quarter (22.5%) eat the amount of oily fish that equates to the recommended intake of Omega 3 fatty acids.

Just over a quarter of young women smoke.

The good news is that very few young women seem to drink more alcohol than is recommended.

These women feel that they are too busy and a significant number of them are tired and stressed about various aspects of their lives. The results show a significant number of young women who are in a spiral of long-term fatigue that

shows up in a number of ways in their lives and is related to how much they exercise. The results also show links between tiredness and:

stress caused by work

concern about health

being busy

sleep problems caused by worry.

If women in their 20s and 30s are tired now, what will they be like when they are older? Given that they seem to be failing to meet medical advice in so many areas, perhaps they would feel a lot better if they adjusted their diets and exercised more (and gave up smoking, if they do so). Indeed, the research behind this report shows that those with 'higher fatigue scores' tend to eat less healthily than those who don't feel as tired and exercise less.

Some of these young women do think about their weight, but maybe the third of them who are either always on a diet or have been on weight loss diets several times should take a wider look at their lifestyles and adopt a more consistent, healthy eating and exercise routine. In addition, with the vast majority failing to have an adequate intake of important vitamins and minerals through their diets, many of them should consider taking a multivitamin supplement to make sure that they achieve the recommended daily amount of vital nutrients.

Only time will tell if this generation of women in their 20s and 30s are going to suffer worse health when they are older than their mothers. What is definitely clear is that they could help themselves immediately by making up the shortfall in their nutritional intake by taking multivitamins, while working to change their eating and exercise habits for the better.

## Section 3

### Survey research results

A total of 80 face-to-face interviews were carried out with women aged 20 to 39 years old during October 2007 in 10 regions in England, Scotland and Wales.

#### Exercise

##### *How often do you exercise\*?*

Base	80
Every day	18.8%
Every other day	5.0%
Three times a week	31.3%
Once a week	18.8%
Once a month	1.3%
Less than once a month	8.8%
Never	16.3%

\*By exercise I mean any physical activity, which you carry out mainly for its own sake, for example going to the gym, playing sport, workouts at home, dancing, running or walking for pleasure etc.

##### *Which of these statements best describes you?*

Base	80
I make time to exercise regularly (e.g. go to the gym, play sport etc)	32.5%
I exercise occasionally when I'm not too tired or too busy	17.5%
I feel I'm active enough in my daily life so don't need additional exercise	18.8%
I know I ought to exercise more but I don't have the time	16.3%

I exercise regularly for a few weeks, then I give up	5.0%
I don't exercise because I don't like it/don't see the point	10.0%

***Do you have a gym membership?***

<b>Base</b>	<b>80</b>
Yes, and I go regularly	13.8%
Yes, but I only go now and again	5.0%
No	81.3%

***What motivates you to exercise?***

<b>Base</b>	<b>80</b>
I need to lose weight	26.3%
I exercise to keep healthy / supple	26.3%
I enjoy being active, exercise gives me energy	17.5%
I play sport/ exercise with friends, so it's a way of socialising	13.8%
I want to stay slim	12.5%
I have a gym membership so I feel I need to use it	8.8%
Nothing - I don't like exercising	18.8%

## Diet

***Which of these best describes your current diet?***

<b>Base</b>	<b>80</b>
Mixed diet, including meat	73.8%
Low calorie/slimming	16.3%
Vegetarian (eat fish and dairy)	3.8%
Vegetarian (eat dairy but not fish or meat)	3.8%
Low fat / No dairy	2.5%

***Thinking about your diet and eating habits do you agree or disagree with the following statements?***

<b>Base =80</b>	<b>Agree</b>	<b>Disagree</b>
I sometimes skip meals because I'm too busy to eat	67.5%	32.5%
I sometimes eat junk food	88.8%	11.3%
I feel guilty after eating junk food	58.8%	41.3%
I had a healthier diet as a child than I do now	47.5%	52.5%
I find it difficult to eat five servings a day of fruit and veg	47.5%	51.2%

***How often do you eat a take-away as your main meal of the day?***

<b>Base</b>	<b>80</b>
Every other day	2.5%
Weekends only	23.8%
Occasionally	65.0%
Never	8.8%

***What is the main reason why you eat take-aways?***

<b>Base (those who eat take-aways)</b>	<b>73</b>
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I like them	37.0%
Its more convenient than cooking	21.9%
My partner likes them	19.2%
I'm too tired to cook in the evening	16.4%
They're cheap	2.7%
The kids like them	2.7%

## Weight loss diets

### *Have you ever been on a weight loss diet?*

<b>Base</b>	<b>80</b>
Yes, once or twice	27.5%
Yes, several times	26.3%
Yes, I'm always on a diet	10.0%
No	36.3%

### *Thinking about the last time you went on a weight loss diet, what was your main reason?*

<b>Base (those who have been on a diet)</b>	<b>51</b>
I felt fat	60.8%
For holiday i.e. to fit into a swimming costume	19.6%
For a special event i.e. wedding	13.7%
I was interested in trying out the latest diet craze	3.9%
No reply	2.0%

### *Do you agree or disagree with each of these statements?*

<b>Base = 80</b>	<b>Agree</b>	<b>Disagree</b>
Seeing images of thin celebrities in the media make me feel fat	53.8%	46.3%
I'd go on a crash diet to lose a few pounds quickly if I needed to	50.0%	50.0%
I'd consider cosmetic surgery to improve my body shape or size	35.0%	65.0%

## The work-place lunch

### *Do you eat less healthily at work than at home?*

<b>Base</b>	<b>80</b>
Yes	25.0%
No	66.3%
No reply	8.8%

### *Why do you think this is?*

<b>Base (Those who eat less healthily at work)</b>	<b>20</b>
Because I'm tempted to eat biscuits/cakes which colleagues bring in	35.0%
Because I snack when I'm bored	30.0%
Because its easier to choose the less healthy option at lunch	35.0%

### *When buying lunch do you take advantage of deals which offer you a free chocolate bar or crisps with your sandwich, even if you don't want it?*

<b>Base</b>	<b>80</b>
Yes	40.0%
No	60.0%

## Food frequency

*How frequently do you eat the following items during an average week?*

Base = 80	3x a day every day	2x a day, every day	Once every day	6 days a week	5 days a week	4 days a week	3 days a week	2 days a week	Once a week	Rarely	Never
Score	21	14	7	6	5	4	3	2	1	0	0
<b>Wholegrains:</b>											
Wholemeal bread (not granary)	-	5.0%	37.5%	2.5%	7.5%	5.0%	13.8%	3.8%	5.0%	12.5%	7.5%
Breakfast cereal	-	-	35.0%	2.5%	12.5%	11.3%	2.5%	11.3%	6.3%	8.8%	10.0%
Beans (all, except string or runner)	-	-	-	2.5%	7.5%	6.3%	20.0%	26.3%	22.5%	10.0%	2.5%
Nuts, seeds	-	-	5.0%	-	3.8%	2.5%	8.8%	7.5%	13.8%	38.8%	20.0%
<b>Fruit and veg:</b>											
Vegetables (not incl. potatoes)	-	1.3%	36.3%	12.5%	18.8%	12.5%	13.8%	2.5%	1.3%	-	1.3%
Salad	-	-	8.8%	5.0%	16.3%	8.8%	23.8%	20.0%	7.5%	7.5%	2.5%
Fruit (fresh or canned)	5.0%	16.3%	25.0%	6.3%	11.3%	10.0%	10.0%	8.8%	1.3%	6.3%	-
Fruit juice (fresh or processed)	5.0%	11.3%	32.5%	2.5%	3.8%	11.3%	11.3%	7.5%	3.8%	10.0%	1.3%
<b>Dairy foods:</b>											
Milk (not just small amounts in tea)	2.5%	2.5%	27.5%	3.8%	5.0%	7.5%	7.5%	8.8%	3.8%	8.8%	22.5%
Cheese	-	1.3%	12.5%	-	6.3%	18.8%	10.0%	25.0%	12.5%	11.3%	2.5%
Yoghurt	-	2.5%	26.3%	5.0%	11.3%	13.8%	7.5%	17.5%	2.5%	12.5%	1.3%
<b>Omega 3:</b>											
Oily fish (sardines, salmon, trout etc)	-	-	-	-	1.3%	5.0%	16.3%	20.0%	16.3%	17.5%	23.8%

A scoring system was then applied as shown to generate mean scores, which should be interpreted as follows:

<b>Total score for wholegrains</b>			
<b>21 or above</b>	<b>14 - 21</b>		<b>13 or under</b>
At least 3 portions a day	Between 2-3 portions a day		Less than 2 portions a day
<b>Total score for fruit and vegetables</b>			
<b>35 or above</b>	<b>21 - 34</b>		<b>20 or under</b>
At least 5 portions a day.	3-4 portions a day		Less than 3 portions a day
<b>Total score for dairy</b>			
<b>21 or over</b>	<b>14 - 20</b>		<b>13 or under</b>
At least 3 portions a day.	2-3 portions a day		Less than 2 portions a day
<b>Score for Omega-3</b>			
<b>3 or over</b>	<b>2</b>	<b>1</b>	<b>0</b>
At least 3 portions of oily fish a week	2 portions of oily fish a week	1 portion of oily fish a week	No oily fish a week

## Consumption of wholegrain foods

	Mean	Standard error
Wholemeal bread (not granary)	4.59	0.39
Breakfast cereal	4.04	0.30
Beans (all, except string or runner)	2.18	0.17
Nuts, seeds	1.19	0.21
Total	12.00	

Daily intake	
Less than 2 portions a day	58.8%
2-3 portions a day	37.5%
At least 3 portions a day	3.8%

## Consumption of fruit and veg

	Mean	Standard error
Vegetables (not including potatoes)	5.38	0.22
Salad	3.26	0.22
Fruit (fresh or canned)	6.90	0.58
Fruit juice (fresh or processed)	6.21	0.57
Total	21.75	

Daily intake	
Less than 3 portions a day	52.5%
3-4 portions a day	32.5%
At least 5 portions a day	15.0%

## Consumption of dairy foods

	Mean	Standard error
Milk (not just small amounts in tea)	4.01	0.48
Cheese	3.04	0.27
Yoghurt	4.20	0.32
Total	15.00	

Daily intake	
Less than 2 portions a day	67.5%
2-3 portions a day	22.5%
At least 3 portions a day	10.0%

## Consumption of Omega-3s

	Mean	Standard error
Oily fish (sardines, salmon, trout etc)	1.31	0.15

Weekly intake	
Less than 1 portion a week	57.5%
2-3 portions a week	20.0%
At least 3 portions a week	22.5%

## Use of dietary supplements

***Are you currently taking dietary supplement(s) e.g. multi-vitamins or other supplements?***

<b>Base</b>	<b>80</b>
Yes, I take them everyday	18.8%
Yes, I take them occasionally	3.8%
No	77.5%

***Which of these are you currently taking?***

<b>Base</b>	<b>18</b>
Multivitamins (e.g. any supplement containing more than one vitamin)	50.0%
Fish oil (e.g. cod liver oil, omega-3 etc)	27.8%
Evening Primrose, borage or starflower oil	27.8%
Other	33.3%

***What is the main reason why you take dietary supplements?***

<b>Base</b>	<b>18</b>
To ensure that my intake of nutrients is adequate	61.1%
For a specific ailment (please specify which ailment)	16.7%
Because I don't eat healthily	5.6%
Because I follow a limited diet (e.g. vegan) and I want to ensure I have the necessary nutrients	5.6%
No reply	11.1%

***Have you taken dietary supplements in the past?***

<b>Base (those who are not currently taking supplements)</b>	<b>62</b>
Yes	29.0%
No	71.0%

**Smoking and alcohol consumption**

***Do you smoke?***

<b>Base</b>	<b>80</b>
Yes	26.3%
No	73.8%

***How many cigarettes do you usually smoke a day?***

<b>Base</b>	<b>21</b>
Fewer than 10	38.1%
10-20	38.1%
20-30	19.0%
30-40	4.8%

***What is the main reason why you smoke?***

<b>Base</b>	<b>21</b>
Habit	47.6%
Stress	19.0%
To be sociable when others are smoking	9.5%
To keep my weight down	9.5%
Pressures at work	4.8%
To help me relax	4.8%
I enjoy it	4.8%

***Do you drink alcohol?***

<b>Base</b>	<b>80</b>
Yes	68.8%
No	31.3%

***How many alcohol units do you drink per week?***

<b>Base</b>	<b>55</b>
1-5	45.5%
6-10	29.1%
11-15	20.0%
16-20	3.6%
21-25	1.8%

***How often do you drink alcohol?***

<b>Base</b>	<b>55</b>
Every day	3.6%
2-6 days a week	45.5%
Once a week	9.1%
Weekends only	16.4%
Less than once a week	25.5%

***What is the main reason why you drink alcohol?***

<b>Base</b>	<b>55</b>
To be sociable when others are drinking	47.3%
I enjoy the taste	23.6%
To help me relax	20.0%
Habit	9.1%

***Do you think you could ever give up drinking and become teetotal?***

<b>Base</b>	<b>55</b>
Yes, without difficulty	38.2%
Yes, but it would be difficult / I'd need to have a very good reason	18.2%
No, but I can't think of a reason why I'd want to	27.3%
No, I could never give up alcohol	16.4%

***Which of these would you find it most difficult to go without?***

<b>Base</b>	<b>80</b>
Chocolate	46.3%
Cigarettes	21.3%
Alcohol	12.5%
Junk food	8.8%
Coffee	8.8%
No reply	2.5%

***How do you feel about your 'bad' health habits?***

<b>Base</b>	<b>80</b>
I enjoy them and wouldn't want to change	11.3%
I enjoy them but I could change them if I had to	30.0%
I feel a bit guilty about them	26.3%
I'd really like to change as I feel they're not doing me any good	25.0%
I don't have any bad health habits	7.5%

## Stress

### *Do you agree or disagree with these statements?*

Base = 80	Agree	Disagree
I sometimes feel as if I've too much to do and too little time to do it	80.0%	20.0%
I'm so busy that it's difficult to find time for myself	70.0%	30.0%
I sometimes feel depressed	61.3%	38.8%
I sometimes find it difficult to sleep due to worry	36.3%	63.7%

### *How stressed do you currently feel about these aspects of your life?*

Base = 80 Base=62 (work)	Not stressed	A little stressed sometimes	Quite stressed	Very stressed
Work	27.4%	31.3%	21.3%	25.0%
Money	22.5%	31.3%	21.3%	25.0%
Family	36.3%	38.8%	11.3%	13.8%
Health	51.2%	32.5%	12.5%	3.8%
Friendships	70.0%	15.0%	12.5%	1.3%

### *What is the one thing, which causes you the most stress or worry in your life?*

Example responses include:

“Money, making sure all the bills are paid”

“Pressure of work”

“Staying in my job longer than six months”

“My child and fitting everything in”

“My relationship between my partner, children and myself”

## Tiredness

The final section of the questionnaire was a series of validated questions on the subject of tiredness. Respondents completed this section themselves, without intervention from the interviewer.

***We would like to know whether or not you have been having any problems with feeling tired, weak or lacking energy in the last month.***

(The answers to this question are used to generate the ‘fatigue scores’ – see below.)

<b>Base = 80</b>	<b>Less than usual</b>	<b>No more than usual</b>	<b>More than usual</b>	<b>Much more than usual</b>
Do you have problems with tiredness?	3.8%	58.8%	32.5%	5.0%
Do you need to rest more?	-	65.0%	31.3%	3.8%
Do you feel sleepy or drowsy?	2.5%	66.3%	28.7%	2.5%
Do you have problems starting things?	8.8%	71.3%	16.3%	3.8%
Do you lack energy?	7.5%	66.3%	23.8%	1.3%
Do you have less strength in your muscles?	7.5%	80.0%	8.8%	2.5%
Do you feel weak?	6.3%	78.8%	12.5%	2.5%
Do you have difficulty concentrating?	5.0%	76.3%	15.0%	3.8%
Do you make slips of the tongue when speaking?	6.3%	72.5%	16.3%	5.0%
Do you have problems thinking clearly?	7.5%	71.3%	20.0%	1.3%
How is your memory?	5.0%	82.5%	11.3%	1.3%

***If you are tired at the moment, please indicate approximately how long this has lasted.***

<b>Base</b>	<b>80</b>
Not Applicable	35.0%

Less than 1 week	25.0%
Less than 3 months	21.3%
Between 3 & 6 months	10.0%
6 Months or more	8.8%

***Overall what percentage of the time do you feel tired?***

<b>Base</b>	<b>80</b>
None of the time	17.5%
25% of the time	53.8%
50% of the time	15.0%
75% of the time	3.8%
All the time	7.5%
No reply	2.5%

## Fatigue

The Chalder fatigue scale is widely used to measure physical and mental fatigue in chronic fatigue syndrome patients<sup>13</sup>. 'Fatigue scores' were generated based on the fatigue questions, using the bimodal system suggested by Chalder where "less than usual" or "no more than usual" is allocated '0' and "more than usual" or "much more than usual" is allocated '1'. As Chalder suggests that a fatigue score of less than 4 is within the normal range but 4 or above indicates abnormal levels of fatigue, respondents were placed into two groups 'under 4' and '4 or over'.

		Base	How long has it lasted?				
			Not feeling tired	Less than 1 week	Less than 3 months	Between 3& 6 months	6 Months or more
<b>Base</b>		<b>80</b>	<b>28</b>	<b>20</b>	<b>17</b>	<b>8</b>	<b>7</b>
Fatigue score	Under 4	55	28	13	9	2	3
		68.8%	100.0%	65.0%	52.9%	25.0%	42.9%
	4 or over	25	-	7	8	6	4
		31.3%	-	35.0%	47.1%	75.0%	57.1%

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<sup>13</sup> Development of a fatigue scale; T Chalder et al; Journal of Psychosomatic Research; 1993, 37(2): 147-53

		Base	Overall what percentage of the time do you feel tired?				
			None of the time	25% of the time	50% of the time	75% of the time	All the time
<b>Base</b>		<b>80</b>	<b>14</b>	<b>43</b>	<b>12</b>	<b>3</b>	<b>6</b>
Fatigue score	Under 4	55	14	31	4	1	3
		68.8%	100.0%	72.1%	33.3%	33.3%	50.0%
	4 or over	25	-	12	8	2	3
		31.3%	-	27.9%	66.7%	66.7%	50.0%

		Base	How long has it lasted?			
			Less than 1 week	Less than 3 months	Between 3& 6 months	6 Months or more
<b>Base</b>		<b>52</b>	<b>20</b>	<b>17</b>	<b>8</b>	<b>7</b>
			<b>38.5%</b>	<b>32.7%</b>	<b>15.4%</b>	<b>13.5%</b>
Overall what percentage of the time do you feel tired?	25% of the time	31	18	11	1	1
			58.1%	35.5%	3.2%	3.2%
	50% of the time	12	1	4	5	2
			8.3%	33.3%	41.7%	16.7%
	75% of the time	3	-	1	1	1
			-	33.3%	33.3%	33.3%
	All the time	6	1	1	1	3
			16.7%	16.7%	16.7%	50.0%

### Diet and fatigue

Cluster analysis was employed to group together respondents who gave similar answers to the food frequency questions. Two clusters were identified: those who tended to eat the specified foods more frequently and therefore could be

assumed to have a 'more healthy' diet and those who ate them less frequently and therefore had a 'less healthy' diet.

The cross analysis of these two clusters with the two fatigue groups is shown in the following table.

		Base	Diet clusters		
			More healthy	Less healthy	Neither
Base		80	35	43	2
Fatigue score	Under 4	55	28	25	2
		68.8%	80.0%	58.1%	100.0%
	4 or over	25	7	18	-
		31.3%	20.0%	41.9%	-
Chi-squared value	4.233836	Contingency coefficient		0.226904	
Phi coefficient	0.232981	Cramér's V		0.232981	
Degree of freedom	1				

## Exercise and fatigue

Respondents were grouped according to exercise frequency:

'Frequently exercise' includes those who exercise at least three times a week

'Occasionally exercise' includes those who exercise once a week to once a month

'Rarely or never exercise' includes those who said they exercise less than once a month or never

		Base	How often do you exercise?		
			Frequently exercise	Occasionally exercise	Rarely/never exercise
<b>Base</b>		<b>80</b>	<b>44</b>	<b>16</b>	<b>20</b>
Fatigue score	Under 4	55	34	11	10
		68.8%	77.3%	68.8%	50.0%
	4 or over	25	10	5	10
		31.3%	22.7%	31.3%	50.0%
Chi-squared value	4.760331	Contingency coefficient		0.236986	
Phi coefficient	0.243935	Cramér's V		0.243935	
Degree of freedom	2				

		Base	Which of these statements best describes you?					
			I make time to exercise regularly (e.g. go to the gym, play sport etc)	I exercise occasionally when I'm not too tired or too busy	I exercise regularly for a few weeks, then I give up	I feel I'm active enough in my daily life so don't need additional exercise	I know I ought to exercise more but I don't have the time	I don't exercise because I don't like it/don't see the point
<b>Base</b>		<b>80</b>	<b>26</b>	<b>14</b>	<b>4</b>	<b>15</b>	<b>13</b>	<b>8</b>
Fatigue score	Under 4	55	24	8	2	10	5	6
		68.8%	92.3%	57.1%	50.0%	66.7%	38.5%	75.0%
	4 or over	25	2	6	2	5	8	2
		31.3%	7.7%	42.9%	50.0%	33.3%	61.5%	25.0%
Chi-squared value		13.975358		Contingency coefficient		0.385633		
Phi coefficient		0.417962		Cramér's V		0.417962		
Degree of freedom		5		50.0% of cells have an expected value of less than 5.				

### Smoking and fatigue

		Base	Do you smoke?		
			Yes	No	
<b>Base</b>		<b>80</b>	<b>21</b>	<b>59</b>	
Fatigue score	Under 4	55	11	44	
		68.8%	52.4%	74.6%	
	4 or over	25	10	15	
		31.3%	47.6%	25.4%	
Chi-squared value		3.551251		Contingency coefficient	0.206165

Phi coefficient	0.210691	Cramér's V	0.210691
Degree of freedom	1		

## Stress and fatigue

### Work

		Base	Work			
			Not stressed	A little stressed some times	Quite stressed	Very stressed
Base		62	17	19	17	9
Fatigue score	Under 4	42	15	13	11	3
		67.7%	88.2%	68.4%	64.7%	33.3%
	4 or over	20	2	6	6	6
		32.3%	11.8%	31.6%	35.3%	66.7%
Chi-squared value		8.219136	Contingency coefficient		0.342125	
Phi coefficient		0.364097	Cramér's V		0.364097	
Degree of freedom		3	12.5% of cells have an expected value of less than 5			

**Health**

		<b>Base</b>	<b>Health</b>			
			<b>Not stressed</b>	<b>A little stressed some times</b>	<b>Quite stressed</b>	<b>Very stressed</b>
<b>Base</b>		<b>80</b>	<b>41</b>	<b>26</b>	<b>10</b>	<b>3</b>
Fatigue score	Under 4	55	34	14	5	2
		68.8%	82.9%	53.8%	50.0%	66.7%
	4 or over	25	7	12	5	1
		31.3%	17.1%	46.2%	50.0%	33.3%
Chi-squared value		8.166013	Contingency coefficient		0.304337	
Phi coefficient		0.319492	Cramér's V		0.319492	
Degree of freedom		3	30% of cells have an expected value of less than 5			

**Being busy**

		<b>Base</b>	<b>I'm so busy that it's difficult to find time for myself</b>	
			<b>Agree</b>	<b>Disagree</b>
<b>Base</b>		<b>80</b>	<b>56</b>	<b>24</b>
Fatigue score	Under 4	55	34	21
		68.8%	60.7%	87.5%
	4 or over	25	22	3
		31.3%	39.3%	12.5%
Chi-squared value	5.610390		Contingency coefficient	0.255996
Phi coefficient	0.264820		Cramér's V	0.264820
Degree of freedom	1			

**Sleep and worry**

		<b>Base</b>	<b>I sometimes find it difficult to sleep due to worry</b>	
			<b>Agree</b>	<b>Disagree</b>
<b>Base</b>		<b>80</b>	<b>29</b>	<b>51</b>
Fatigue score	Under 4	55	15	40
		68.8%	51.7%	78.4%
	4 or over	25	14	11
		31.3%	48.3%	21.6%
Chi-squared value	6.137808		Contingency coefficient	0.266938
Phi coefficient	0.276988		Cramér's V	0.276988
Degree of freedom	1			



## Appendix 1

### Explanation of statistical terms

The purpose of experimental science is to prove or disprove a hypothesis. However, the results of any single experiment may be due to chance or to variations in conditions, which were not controlled. A single experiment cannot therefore be said to provide conclusive proof of a hypothesis. This is particularly so where there are a large number of uncontrolled or unknown influences on the data (for example in psychological experiments). **Statistical tests** are used to measure the degree of confidence we can have in a result not being due to chance or random effects, and therefore how confident we can be that our hypothesis is accepted as correct or rejected as wrong.

#### Significance levels

Significance levels measure the extent to which a particular result might have been achieved by chance and statistical significance is often expressed as a percentage or a 'p' value. There are different levels of statistical significance and scientists continue to debate the level, which is deemed 'significant', but the following three are the most commonly used:

$P < 0.001$  - there is a 0.1% probability that the result is due to chance

$P < 0.01$  - there is a 1% probability that the result is due to chance

$P < 0.05$  - there is a 5% probability that the result is due to chance (that is, a one in 20 chance that the result was accidental)

Clearly, the lower the p value (and the lower the percentage) the more reliable the result. Higher p values (such as  $p < 0.1$  or 10%) may be used to gain a measure of tendency and are often used in the social sciences, but other scientists do not consider them useful.

## **Correlation**

Correlation is a statistical method of determining whether one set of data moves in the same direction as another set of data (positive correlation) or in the opposite direction (negative correlation) or whether the two sets of data are independent. Different tests can be used depending on the type of data available and the choice of test is a major consideration in the experimental design, prior to data collection. Once a correlation test has been run, the p value is generated to give a measure of confidence in the result.

A correlation does not indicate that one of the factors 'causes' the other; it merely indicates a relationship between them. There may be another factor, which is the root cause of both. There are currently no statistical tests available, which measure causality (although some statisticians are working on developing them).

## **t-test**

t-test is another useful statistical test which measures the difference in the means between several data sets and generates a confidence interval to say whether the data sets are sufficiently similar to be from the same population or sufficiently different to be from different populations.

## **Cross analysis**

Cross analysis directly compares one data set against another with the output usually being given in percentages. It is commonly used to compare the frequency of answers to one question with the frequency of answers to another question. A t-test or other test can be used to measure the differences between the frequencies.

## **Cluster analysis**

Cluster analysis is a sophisticated method of analysis designed to identify patterns in data that may not be immediately obvious. Its object is to sort data into 'clusters', so that the members of a particular cluster are similar to each other but

members of different clusters are dissimilar. It is a very useful technique in that it makes no assumptions about the data prior to the analysis; however, for this reason it needs careful interpretation.

### **Statistics vs common sense**

A significant result to a statistical test does not necessarily mean that the result is meaningful or sensible. Statistics must not be used as a replacement for common sense, which should always be employed before, during and after the analysis.

Statistical tests do not offer conclusive proof: the results are dependent on many factors including the size of the data set, the number of subjects, the scoring systems used and so on. Changing any of the parameters can alter the results and care has to be taken in the interpretation of results in the light of this.